Programa Ambiente, Alterações Climáticas e Economia de Baixo Carbono

'Programa Ambiente'

Mecanismo Financeiro do Espaço Económico Europeu 2014 – 2021

Final Report

14/01/2022

10_SGS#1_REFILL_H2O

De acordo com os Artigos 25º, nº 2, alínea j) e 29º, nº4 do 'Guia para os Candidatos ao Financiamento de Projetos de Ambiente, sobre Alterações Climáticas e Economia de Baixo Carbono'

https://www.eeagrants.gov.pt/media/2993/guia-para-o-financiamento-projetos-eea-grants_programa-ambiente_28112019.pdf

Índice

i. Detailed Description

Once the Project has been completed, it should be noted that the execution of the project concerning the initially outlined planning, contained in the contract 10_SGS#1_REFILL_H2O established between the parties, was fully carried out and successfully.

The amendments to the contract brought some adjustments that we believe were crucial for us to achieve the assumed objectives. The difficulties encountered and which are common in the development of this type of action were overcome with common efforts and we thank you for opening the program to the adjustments made.

In summary of the project:

Activity 1 took place without constraints, achieving the expected indicators.

Activity 2, starting on February 1, 2021 and scheduled for completion on August 1, 2021, was considerably delayed due to constraints related to the delay in the supply of raw materials needed not only for the manufacture of reusable bottles, as well as the industrial production of treated water filling stations, namely in terms of the import of electronic components essential to their manufacture.

The delay in activity 2 ended up interfering with the start of activities 3 and 4, as they directly depend on the conclusion of the preceding one.

The industrial production of the 9 filling stations and 10,000 reusable bottles had the collaboration of the company NWP – New Water Project, Lda., with which a partnership agreement was established already presented in Report 2. It should be noted, by the way, that in the application of the Refill_H2O Project, the production of 6000 reusable bottles was planned, however, the IPVC contracted the production of 10000 units for the estimated cost of 6000. September and October 2021, with the prior careful selection of the installation location of the aforementioned stations in each of the 6 IPVC schools, in the Academic Center and the Central Services and Presidency building, as well as with the execution in situ of the necessary water supply, wastewater drainage and electrical supply networks, all these infrastructures necessary for their proper functioning. It should be noted that the 9th refilling station is a mobile station, designed to function as a pilot demonstrator in primary and secondary schools in Alto Minho in 2022, as well as on the beaches of the region during the period corresponding to the bathing

season. The location of the refilling stations in each of the 6 schools, in the Academic Center and the Presidency and Central Services Building deserved special care in this phase of the Project: it was essential to select a central location, with easy access to potential users (students, teaching and non-teaching staff), served by infrastructure and accessible for maintenance purposes.

A public session to launch refill water stations and the smart reusable bottles took place at all IPVC schools, Academic Center, and Presidency and Central Services Building, on November 25, 2021, with the presence of the IPVC President, and all other partners of the Refill_H20 Project in a public session open to the Media.

In activity 3, 8 refill water stations were put into service in all IPVC schools and in the hall of residence "Academic Centre", where it was possible to observe a change in student behavior. Although it is very evident that most students use reusable bottles very often, some of them refill their bottles at the existing water points (water dispensers, drinking fountains, drinkers, taps) on the school campus. The other part takes advantage of the refill water station and therefore values the taste and superior quality of the filtered water. The number of reusable bottles that circulate through the corridors of schools is notorious, which demonstrates that habits are in transition. It is known that the change could take years, so it is our role as a higher education institution to continue to encourage the use of the station and the bottle, forbidding the sale of single-use plastic bottles again in our bars, and avoiding therefore the consumption of more than 15,000 bottles per year.

Activity 4 began with an awareness session on October 1, 2022, at Praia Norte de Viana do Castelo, taking advantage of a sunny Saturday with a lot of citizens, as usual on days with favorable weather conditions.

In the last week of September 2022, a beach cleaning and awareness-raising action was scheduled at Praia do Lumiar, in Carreço, Viana do Castelo. However, weather conditions forced its postponement.

20 awareness sessions were carried out in a large number of schools in the Alto Minho region, with a set of photographs being collected that appear in the attached folder "Sensitization of Schools".

In short, the main objective of the project was achieved by removing single-use water bottles from the IPVC bars. However, it was noted a difficulty in changing students' behavior in using the

refill water station, often opting to "Refill" their bottles at the existing water points (water dispensers, drinking fountains, drinkers, taps) in the school campus despite the incentive campaigns to use the refill station. It is known that behavior change is not always immediate, so we will continue to work to create a good practice in the institution and the visibility of the project lasts over time.

Table 1 identifies a summary of the actions carried out for the project activities, including a brief description of the action, and a field for observations.

Table 1 shows a summary of the actions taken for activities 1, 2, 3, and 4.

Activity	Action	Qualitative metric	Notes/Remarks
1 – Drawing up the requirements for the refiling station and the smart reusable bottle	Undertake a survey of the target audience at IPVC for the "specification leaflet" implementation.	Done	Done within the estimated time
1 – Drawing up the requirements for the refiling station and the smart reusable bottle	Writing of the "terms of reference" containing the technical requirements for the "refill water station" and the "smart reusable bottle" with a built-in RFID reader.	Done	Done within the estimated time
2 – Development and design	The design stage of the "refill water station" and the "smart reusable bottle".	Done	Done within the estimated time
2 – Development and design	The manufacturing production stage of the "refill water station" and the "smart reusable bottle".	Done	Implemented in accordance with the approved plan.
2 – Development and design	Infrastructures work for "refill water station" installation - water supply, wastewater drainage and power supply.	Done	Implemented in accordance with the approved plan.
2 – Development and design	"refill water station" and the "smart reusable bottle" launch session.	Done	Implemented in accordance with the approved plan.
3 – Experimental approach after in situ installation	Start-up of the "refill water station" at IPVC schools and other facilities. Plastic bottles removal from IPVC	Done	The 9 "refill water station" devices were put into operation. 1 device

	bars, restaurants and school canteens.		alternated between events and exhibition fairs.
3 – Experimental approach after *in situ* installation	Collection of environmental indicators related to water consumption, plastic consumption reduction and consequent reduction of GHG emissions.	Done	Implemented in accordance with the approved plan.
3 – Experimental approach after *in situ* installation	Project Media dissemination and results divulgation among the scientific community.	Done	The dissemination actions were implemented since the beginning of the project.
4 - Results dissemination and awareness-raising actions	Results dissemination and awareness-raising actions at 10 basic schools and 10 secondary schools in Alto Minho region.	Done	20 actions were carried out in a set of schools in Alto Minho region.
4 - Results dissemination and awareness-raising actions	Dissemination of the project in an awareness-raising action that took place in a local beach.	Done	An awareness-raising action was carried out in Praia Norte, Viana do Castelo.

Table 1 - Detailed description of activities/actions

Throughout the entire project, result from dissemination and awareness-raising actions were carried out to promote the reduction in the consumption of single-use plastic bottles and to make more attractive the use of the "refill water station" and the "smart reusable bottle".

ii. Obtained Results

Table 2 presents a summary, by activity, of the technical execution of the project in the period to which the report refers, incorporating the indicators and targets defined in the contract, and including intermediate results.

ID Act.	Activity Description	Beginning	End	Indicator	Target	Intermediate Result	Technical Implementation
1	Draw up a survey and apply it to IPVC community.	2020-12-01	2020-12-31	Survey	500 answers	No intermediate result	Done
1	Terms of Reference concerning the "refill water station" and the "smart reusable bottle".	2020-12-01	2020-12-31	Terms of Reference	1	No intermediate result	Done
2	"Refill water station" design stage and ensuing manufacturing production.	2021-02-01	2021-11-25	Refill water station	9	No intermediate result	Done

2	"Smart reusable bottle" design stage and ensuing manufacturing production.	2021-02-01	2021-11-25	Smart reusable bottle	10000	No intermediate result	Done
3	Experimental approach after in situ installation.	25-11-2021	25-06-2022	Refill water station put into operation	8	8 Refill water station in operation	Done
3	Experimental approach after in situ installation.	25-11-2021	25-06-2022	Amount of plastic avoided after the project is put into operation.	8	Water consumption is below expectations. All PET bottles were removed from bars, canteens and restaurants.	Done
4	Results dissemination and awareness-raising actions	25-08-2022	31-12-2022	Dissemination actions	22	No intermediate result	Done

Table 2 – Project implementation

Concerning the execution of the project's Communication Plan, the following actions were carried out in terms of communication in the area of research and development:

Participation in fairs and events

- Event "Sinergias entre Ambiente e Crescimento Azul - Economia circular e redução de lixo marinho", Pavilhão do Conhecimento in Lisbon, May 3, 2022;

- Event "Qualifica – Feira de Educação, Formação, Juventude e Emprego", Exponor, April 20 to 23, 2022;

- Event "futurália – Feira de Emprego e Empregabilidade", FIL – Lisbon International Fair, March 30, 2022 to April 2, 2022;

- "Hidrata-te" competition, along with the Academic Federation of IPVC, in which during the month of April 2022, the student with the highest water consumption won a pass to the IPVC academic week.

- Action to publicize the project among those responsible for the municipalities of Alto Minho;

- Action to publicize the project with garbage collection at Praia do Lumiar, in Viana do Castelo;

- Action to publicize the project at Praia Norte, in Viana do Castelo.

- Actions to publicize the project in 20 schools in Alto Minho.

Master (MSc) Thesis

João Miguel Ferreira Mendes (2021), "Design e Sustentabilidade na Academia: o caso prático da redução do consumo de garrafas de plástico na comunidade". MSc in "Design Integrado", Polytechnic Institute of Viana do Castelo, Portugal. November 26, 2021. Repository: http://hdl.handle.net/20.500.11960/2620

Project submitted to Green Product Award 2021 and ranked 6th (https://www.gp-award.com/en).

Nominee page link:
https://www.gp-award.com/en/produkte/refill-h20

Nominee seal for communication:
https://www.gp-award.com/downloads/Green_Concept_Award_Nominee_2022.zip

The Green Product Award is an annual international award for innovative and sustainable products and services. In addition to rewarding established companies and start-ups, it rewards new disruptive and innovative concepts with the Green Concept Award.

The aim of the award is to create public recognition of green solutions for consumers, making the products more visible, thus recommending them to potential manufacturers. In addition, it is intended to establish a platform for the transfer of green knowledge, through which links are established between designers, producers and specialists for development, implementation and marketing of author products.

The award was established in 2013 and has since received entries from over 54 countries. Since that date, the award-winning solutions have been presented to more than 1,000,000 visitors at international fairs and various design events. The impact on the international media, in the area of companies and businesses, and on the licensing of new solutions and investments make this international award the target of privileged attention in the area of design.

Book Section

Azeredo P., Curralo A., Curado A., Lopes S.I. A Methodological Design Approach for Health Education: Indoor Radon Exposure Case Study. In: Martins N., Brandão D. (eds) Advances in Design and Digital Communication II. DIGICOM 2021. Springer Series in Design and Innovation, vol 19. Springer, Cham, DOI:10.1007/978-3-030-89735-2_44

Mendes J., Curralo A., Curado A., Lopes S.I. Fostering Sustainability on Campus: Design of an IoT-Enabled Smartbottle for Plastic Reduction in the Academic Environment. In: Raposo D.,

Martins N., Brandão D. (eds) Advances in Human Dynamics for the Development of Contemporary Societies. AHFE 2021. Lecture Notes in Networks and Systems, vol 277. Springer, Cham. DOI: 10.1007/978-3-030-80415-2_3

Curralo, A., Faria, P., Curado, A., Azeredo, P., Lopes, S. (2022). Designing a UX Mobile App for Hydration and Sustainability Tracking in Academia. In: Tareq Ahram and Christianne Falcão (eds) Usability and User Experience. AHFE (2022) International Conference. AHFE Open Access, vol 39. AHFE International, USA.

http://doi.org/10.54941/ahfe1001692

Articles

Fostering Sustainability on Campus: Design of an IoT-Enabled Smartbottle for Plastic Reduction in the Academic Environment, João Mendes, Ana Curralo, António Curado, Sérgio I. Lopes, Advances in Human Dynamics for the Development of Contemporary Societies, Volume 277, (2021) 18-25

Joining Sustainable Design and Internet of Things Technologies on Campus: The IPVC Smartbottle Practical Case, A.F. Curralo, S.I. Lopes, J. Mendes, A. Curado, Sustainability (Switzerland), Volume 14, Issue 10, (2022).

The Sustainable Smartbottle: A Proposed Design Methodology to Minimize Plastic Pollution Mendes J., Curralo A., Curado A., Lopes S.I. Advances in Design and Digital Communication. Digicom 2020. Springer Series in Design and Innovation, vol 12, (2021) 617.

Towards a smart & sustainable campus: An application-oriented architecture to streamline digitization and strengthen sustainability in academia. P. Martins, S.I. Lopes, A.M.R. da Cruz, A. Curado. Sustainability (Switzerland), Volume 13, Issue 6, (2021)

Oral Communications

Mendes J., Curralo A., Curado A., Lopes S.I. Fostering Sustainability on Campus: Design of an IoT-enabled Smartbottle for plastic reduction in the Academic Environment. Advances in Human Dynamics for the Development of Contemporary Societies. AHFE 2021. 12th International Conference on Applied Human Factors and Ergonomics, 25 - 29 July, Virtual conference, 2021.

F. Curralo (2022), P. M. Faria, P. Azeredo, A. Curado, S. I. Lopes. “Designing a UX Mobile App for Hydration and Sustainability Tracking in Academia”, 13th International Conference on Applied

Human Factors and Ergonomics (AHFE 2022). July 24-28, 2022, New York, USA. DOI: 10.54941/ahfe1001692

Produced videos

Launch session of the "refill water station" and the "smart reusable bottle" (25/11/2021)

https://youtu.be/JglrlUx5RKc

Tutorial on the use of the "refill water station"

https://youtu.be/Yx7slTnA_MM

Project's presentation_1

https://youtu.be/jkrQezMVNQE

Project's presentation_2

https://www.youtube.com/watch?v=jkrQezMVNQE&t=60s&ab_channel=IPVC-InstitutoPolit%C3%A9cnicodeVianadoCastelo

Publications on the IPVC Website

March 23, 2021

Refill - IPVC testa projeto piloto - Instituto Politécnico de Viana do Castelo

December 2, 2021

Garrafa em forma de orca nomeada para prémio internacional - Instituto Politécnico de Viana do Castelo (ipvc.pt)

Report in the Viana Channel TV

November 30, 2021
https://www.facebook.com/canalviana.vc/videos/429251082127553/

The report in the Peneda Gerês Channel TV

November 30, 2021

Garrafa desenvolvida por aluno do IPVC nomeada para prémio internacional

https://www.penedagerestv.com/post/garrafa-desenvolvida-por-aluno-do-ipvc-nomeada-para-pr%C3%A9mio-internacional

November 23, 2021

Projeto Refill H2O do IPVC distribui 10 mil garrafas reutilizáveis

https://www.penedagerestv.com/post/projeto-refill-h2o-do-ipvc-distribui-10-mil-garrafas-reutiliz%C3%A1veis

Press Reports

Politécnico de Viana do Castelo vai distribuir 10 mil garrafas reutilizáveis

Refill H2O é o nome do projeto que arranca no início do ano letivo. A iniciativa é coordenada pelo investigador do IPVC, António Curado, e pretende retirar, anualmente, das seis escolas superiores do ...

In Ambiente Online | 31-08-2021

IPVC distribui 10 mil garrafas reutilizáveis pela comunidade académica

A partir de hoje IPVC distribui 10 mil garrafas reutilizáveis pela comunidade académica O Instituto Politécnico de Viana do Castelo (IPVC) distribui pela comunidade académica, a partir de hoje, 10 mil garrafas reutilizáveis, para retirar mais de uma tonelada de plástico das suas seis escolas

In Correio do Minho | 24-11-2021

Politécnico de Viana distribui 10 mil garrafas reutilizáveis

ambiente O Instituto Politécnico de Viana do Castelo (IPVC) distribui pela comunidade académica, a partir de hoje, 10 mil garrafas reutilizáveis, para retirar mais de uma tonelada de plástico das suas seis escolas, foi ontem divulgado

In Diário do Minho | 24-11-2021

Politécnico de Viana distribui 10 mil garrafas reutilizáveis

In Jornal de Notícias | 24-11-2021

Politécnico de Viana distribui 10 mil garrafas reutilizáveis e cria nove estações de reenchimento

A cerimónia de lançamento do Projeto Refill H20 realiza-se quarta-feira, às 11 horas O Instituto Politécnico de Viana do Castelo (IPVC) distribui pela comunidade académica, a partir de quarta-feira, 10 mil garrafas reutilizáveis, para retirar mais de uma tonelada de plástico das suas seis escolas, foi hoje divulgado

In Minho Online (O) | 23-11-2021

Politécnico de Viana do Castelo distribui 10 mil garrafas reutilizáveis

Em causa está o projeto-piloto Refill H2O, coordenado pelo investigador do IPVC António Curado, que contempla ainda nove estações de reenchimento. O projeto é lançado na quarta-feira, às 11:00, nos serviços centrais do IPVC e vai ser divulgado junto das escolas secundárias do Alto Minho e de outras instituições da região

In Rádio Alto Minho Online | 23-11-2021

IPVC distribui 10 mil garrafas reutilizáveis pela comunidade académica

O Instituto Politécnico de Viana do Castelo (IPVC) vai distribuir pela comunidade académica, a partir de quarta-feira, 10 mil garrafas reutilizáveis, para retirar mais de [...] O Instituto Politécnico de Viana do Castelo (IPVC) vai distribuir pela comunidade académica, a partir de quarta-feira, 10 mil garrafas reutilizáveis, para retirar mais de uma tonelada de plástico das suas seis escolas

In Alto Minho Online | 24-11-2021

Ambiente: Politécnico de Viana do Castelo distribui 10 mil garrafas reutilizáveis e cria nove estações de reenchimento

O Instituto Politécnico de Viana do Castelo (IPVC) distribui, a partir de amanhã, pela comunidade académica 10 mil garrafas reutilizáveis. Projeto piloto, Refill H2O, coordenado pelo investigador do IPVC, António Curado, vai retirar, anualmente, das seis Escolas Superiores do IPVC, mais de uma tonelada de garrafas plásticas de utilização única

In Jornal C - O Caminhense Online | 24-11-2021

Politécnico de Viana do Castelo distribui 10 mil garrafas reutilizáveis

O Instituto Politécnico de Viana do Castelo (IPVC) distribui, a partir de amanhã, pela comunidade académica 10 mil garrafas reutilizáveis. Projeto piloto, Refill H2O, coordenado pelo investigador do IPVC, António Curado, vai retirar, anualmente, das seis Escolas Superiores do IPVC, mais de uma tonelada de garrafas plásticas de utilização única

In Semanário V Online | 24-11-2021

Politécnico de Viana "é exemplo" no "combate feroz" para reduzir plástico

Distribuídas 10 mil garrafas reutilizáveis e criados 9 pontos de enchimento O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no "combate feroz" para reduzir o plástico de uso único, graças ao projeto Refill H2O, lançado hoje, com distribuição de 10 mil garrafas reutilizáveis em todas as Escolas Superiores, Serviços de Ação Social e Serviços Centrais

In Minho Online (O) | 25-11-2021

Politécnico de Viana do Castelo distribui 10 mil garrafas reutilizáveis e cria nove estações de reenchimento

A cerimónia de lançamento do Projeto Refill H20 realizou-se na 4ª feira. w O Instituto Politécnico de Viana do Castelo (IPVC) distribui pela comunidade académica 10 mil garrafas reutilizáveis. Projeto piloto, Refill H2O, coordenado pelo investigador do IPVC, António Curado, vai retirar, anualmente, das seis Escolas Superiores do IPVC, mais de uma tonelada de garrafas plásticas de utilização única

In Minho Digital Online | 26-11-2021

Politécnico de Viana do Castelo apresenta projeto para reduzir plástico de uso único

"Esta é uma cerimónia singela, mas com um significado enorme dada a sua dimensão e necessidade global", começou por assumir o presidente do Politécnico de [...] Pedro Xavier Há 59 minutos Politécnico de Viana do Castelo apresenta projeto para reduzir plástico de uso único O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no "combate feroz" para reduzir o plástico de uso único

In Geice FM Online | 26-11-2021

IPVC "é exemplo" no "combate feroz" para reduzir plástico de uso único

O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no "combate feroz" para reduzir o plástico de uso único. Com o projeto Refill H2O, lançado hoje, foi possível distribuir 10 mil garrafas reutilizáveis em todas as Escolas Superiores, Serviços de Ação Social e Serviços Centrais e disponibilizar nove estações de reenchimento a toda a comunidade académica

In Jornal C - O Caminhense Online | 26-11-2021

Viana: Politécnico de Viana do Castelo dá o exemplo no combate ao plástico

Com o projeto Refill H2O, lançado esta sexta-feira, o Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no "combate feroz" para reduzir o plástico de uso único. Este projeto possibilitou a distribuição de 10 mil garrafas reutilizáveis em todas as Escolas Superiores, Serviços de Ação Social e Serviços Centrais e disponibilizar nove estações de reenchimento a toda a comunidade académica

In e24.pt Online | 26-11-2021

IPVC de Viana do Castelo é exemplo no combate para reduzir plástico de uso único

Projeto, que vai permitir retirar uma tonelada de plástico anualmente só dos espaços do IPVC, será ainda divulgado nas escolas básicas e secundárias e nas praias do Alto Minho. O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no "combate feroz" para reduzir o plástico de uso único

In Semanário V Online | 26-11-2021

Dez mil garrafas reutilizáveis foram distribuídas por toda a comunidade IPVC no âmbito do projecto piloto Refill H20

Novembro 26, 2021Novembro 27, 2021 por Redação COMENTAR O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no combate para a redução de plástico de uso único. Com o projevto Refill H2O foi possível distribuir 10 mil garrafas reutilizáveis em todas as Escolas Superiores, Serviços de Acção Social e Serviços Centrais e disponibilizar nove estações de reenchimento a toda a comunidade académica

In Amarense Online (O) | 27-11-2021

Dez mil garrafas reutilizáveis foram distribuídas por toda a comunidade IPVC no âmbito do projecto piloto Refill H20

O Instituto Politécnico de Viana do Castelo (IPVC) deu mais um passo no combate para a redução de plástico de uso único. Com o projevto Refill H2O foi possível distribuir 10 mil garrafas reutilizáveis em todas as Escolas Superiores, Serviços de Acção Social e Serviços Centrais e disponibilizar nove estações de reenchimento a toda a comunidade académica

In Jornal O Vilaverdense Online | 27-11-2021

IPVC dá "mais um passo rumo à sustentabilidade"

O Instituto Politécnico de Viana do Castelo (IPVC) já distribuiu 10 mil garrafas reutilizáveis, no âmbito do projeto Refill H2O. "Este é mais um passo rumo à sustentabilidade", referia o mentor do projeto na cerimónia oficial de distribuição, que aconteceu na manhã de dia 25 de novembro

In Aurora do Lima Online (A) | 02-12-2021

Vimaranense João Mendes está na corrida ao prémio internacional Green Award Design 2022
https://www.guimaraesdigital.com/index.php/informacao/bigger/70942-vimaranense-joao-mendes-esta-na-corrida-ao-premio-internacional-green-award-design-2022
In Guimarães Digital | 31-12-2021

Other Media Dissemination Actions

in TSF: https://www.tsf.pt/portugal/sociedade/politecnico-de-viana-do-castelo-tira-uma-tonelada-de-plastico-da-instituicao-por-ano-13504803.html

in O Minho: https://ominho.pt/politecnico-de-viana-do-castelo-tira-um-tonelada-de-plastico-da-instituicao-por-ano/

in Vieira do Minho TV: https://vieiradominhotv.sapo.pt/refill-h2o-politecnico-de-viana-do-castelo-lanca-projeto-piloto-que-vai-retirar-mais-de-1-tonelada-anual-de-plasticos-de-uso-unico-na-instituicao/

in Rádio Alto-Minho: https://radioaltominho.sapo.pt/noticias/projeto-do-politecnico-de-viana-do-castelo-foi-considerado-o-melhor-entre-24-candidaturas-ao-programa-ambiente-alteracoes-climaticas-e-economia-de-baixo-carbono/

in O Vilaverdense: https://ovilaverdense.pt/politecnico-de-viana-sobe-179-posicoes-entre-as-entidades-de-ensino-superior-mais-sustentaveis-do-mundo/

in O Caminhense: https://jornalc.pt/viana-do-castelo-ipvc-considerada-uma-das-entidades-de-ensino-superior-mais-sustentaveis-do-mundo/?v=35357b9c8fe4

in Aurora do Minho: https://www.auroradolima.com/featured/politecnico-vai-reduzir-plastico/

*in Publico:*https://www.publico.pt/2021/08/30/p3/noticia/politecnico-viana-castelo-vai-distribuir-10-mil-garrafas-reutilizaveis-1975689

*in Ambiente online:*http://www.ambienteonline.pt/canal/detalhe/politecnico-de-viana-do-castelo-vai-distribuir-10-mil-garrafas-reutilizaveis

*in Rádio Comercial:*https://radiocomercial.iol.pt/noticias/114140/politecnico-de-viana-do-castelo-vai-distribuir-10-mil-garrafas-reutilizaveis

iii. Costs Description and assessment of financial impact

The financial execution of the operation started in January 2021, and the structure of costs incurred during the term of the project went according to the plan in the application.

Concerning the financial implementation of the project activities, it is important to clarify the following:

1)Project management activity: allocation of the technical team associated with the project (100% of Human Resources execution corresponding to all entire activity);

2) Activity 1: allocation of the technical team associated with the project (100% execution);

3) Activity 2: allocation of the technical team associated with the project (100% execution of Human Resources). The cost associated with the "smart reusable bottle" and "Refill water station" design stage and ensuing manufacturing production were fully executed.

4) Activity 3: allocation of the technical team associated with the project (100% of execution); The cost associated with the Experimental approach after in situ installation was fully executed.

5) Activity 4: The cost associated with the results dissemination and awareness-raising actions was implemented with a 66% of execution rate. In fact, the end date of the project (31/12/2023) couldn´t allow some expenses related to the project's scientific publications and publicity could not to be associated with the operation.

The Polytechnic Institute of Viana do Castelo instructed the 1st and 2nd payment requests on December 3, 2021, the 3rd payment request on March 2022, and the 4th payment request on February 2023. The payment request of Área Alto Minho was instructed on February 2023.

Table 3 summarizes all payment requests submitted, showing the overall execution rate and per activity.

Activity	Budget	1PP - IPVC	2PP - IPVC	3PP - IPVC	4PP - IPVC	1PP - AAM	% EXECUTION
Project management	7 947,36 €	2 547,82 €	1 119,54 €	752,05 €	3 506,46 €		100%
Output/Activity 1	1 059,85 €	1 063,04 €					100%
Output/Activity 2	93 476,59 €	6 378,16 €	135,30 €	74 895,93 €	12 319,98 €		100%
Output/Activity 3	6 359,09 €			1 063,03 €	5 362,96 €		101%
Output/Activity 4	31 506,75 €		1 374,30 €	527,00 €	10 737,56 €	8 032,50 €	66%
Total 1	**140 349,64 €**	**9 989,02 €**	**2 629,14 €**	**77 238,01 €**	**31 926,96 €**	**8 032,50 €**	**92%**
INDIRECT COSTS	35 087,41 €	2 497,26 €	657,29 €	19 309,50 €	7 981,74 €	2 008,13 €	92%
Total 2	**175 437,05 €**	**12 486,28 €**	**3 286,43 €**	**96 547,51 €**	**39 908,70 €**	**10 040,63 €**	**92%**

Table 3 – Project implementation

iv. Description of the Project's contribution to achieving the general objectives of the EEA Grants and the 'Environment Program'

Sustainable development is expected to foster a more compassionate, fairer, and broad-minded exploration of planetary resources, strongly committed to reinforcing the respect for life on Earth for future generations, by respecting mankind and nature. This embodies the basis of the AGENDA 2030 to reach Sustainable Development Goals (SDGs). To reach more sustainable development, Higher Education Institutions (HEIs) play a leading role in the educational training of their public, therefore assuming a major intervention in Sustainable Development. The Polytechnic Institute of Viana do Castelo (IPVC), in northern Portugal is such an institution, fully committed to playing a central role in the implementation of policies that contribute to a circular, low-carbon economy and sustainable socio-environmental systems, in close alignment with regional, national, cross-border and global strategic options, namely those defined in the United Nations SDGs, as well as contributing to achieving the overall objectives of the EEA Grants and the Environment Programme.

Under the scope of sustainable development, IPVC is conducting a pilot project named Refill_H2O which aims to eliminate the use of plastic water bottles on the IPVC Campus, through the design and development of an interactive smart and sustainable bottle that communicates with an intelligent water refill station to promote ecologically correct attitudes among local users, such as students, professors, researchers, and other academic staff, thus contributing to the reduction of plastic consumption in bars, canteens, and residences within the IPVC premises. The final objective of this project is to tackle plastic pollution in the Earth's environment which adversely affects wildlife, wildlife habitats, and humans. Although all marine life is in decline due to ocean pollution, in the next 30 to 50 years, a large proportion of marine animals could lose more than half of their population due to hazardous substances in seawater.

By embracing Refill_H2O project, the IPVC desired to take a lead as a sustainability model of excellence, bearing therefore special responsibilities concerning environmental sustainability and sustainable development, understood as the ability to meet present needs without compromising future generations' ability to meet their needs. Additionally, Refill_H2O tried to encourage ecological behaviors in the academic community contributing to a paradigm shift through new habits by favoring the eradication of single-use plastic water bottles and respective waste and pollution. The project involved staff, students, teachers and researchers, demonstrating through real-life problem-solving the meaning of sustainable design and customer-focused technology.

The in-situ implementation of Refill_H2O project reached all of the IPVC premises, including bars, canteens, and residences. In addition to raising ecological awareness and change towards a sustainability mindset, the tangible system developed is composed of a sustainable reusable smart bottle that interacts/communicates with a refill station supplying filtered water. Both

products (smart, sustainable bottle and water refill station) were subject to a previous survey applied throughout the IPVC community, based on the methodological concept of Design Thinking, towards the coexistence of social and technological development options in systems that require human interaction, involving the users in the design of the products they will afterward use. The development of both products progressed simultaneously since the implementation of interactive artifacts poses technological challenges, namely concerning the identification of technologies for wireless communication which must allow the interaction between the bottle and the refill station.

Therefore, the project is in perfect alignment with the general objectives of the EEA Grants and the 'Environment Programme', namely presenting itself as an innovative project that promotes the application of the principles of the circular economy, through the reduction of the use of materials and production of waste, in particular, a return system for plastic bottles.

Below is table 4, which reflects the project's contribution to the EEAGrants objectives, namely the outcome and output of the Environment Programme:

	Indicator	**Related Activity**	**Goal**	**Project Contribution**
PA 11 Objectiv 1	**Tons of Plastic avoided resulting from the support of** 'Programa Ambiente'	3	0,008 ton (8 Kg)	>0.008
Output 1.3	**Number of awareness-raising campaigns implemente**	4	25	26

Table 3 - Contribute of the project to EEAGrants objectives

iv. Project contribution to bilateral relations with donor countries

As there is no direct relationship between the project and partners in donor countries, its contribution may not be as measurable, however, it is important to reflect on the results obtained and on the possibility of replicating this type of solution in donor countries. It is known today that economic and cultural issue has a strong influence on consumers' choice of this solution and surely the openness in donor countries for the adoption of these practices will be very well received by the population and will be an excellent contribution to the environmental causes of same.

O Promotor do Projeto

Nome	António Curado
Data e Assinatura	Assinado por : **António José Candeias Curado** Num. de Identificação: 10082069 Data: 2023.02.16 16:32:02+00'00'
Posição	Coordenador do Projeto

O Operador do Programa – Secretaria Geral do Ambiente

Nome	Alexandra Carvalho
Data e Assinatura	Maria Alexandra Martins Ferreira de Carvalho Assinado de forma digital por Maria Alexandra Martins Ferreira de Carvalho DN: c=PT, title=Secretária-Geral, o=Secretaria-Geral do Ambiente e da Ação Climática, cn=Maria Alexandra Martins Ferreira de Carvalho Dados: 2023.03.24 17:35:57 Z
Posição	Secretária Geral